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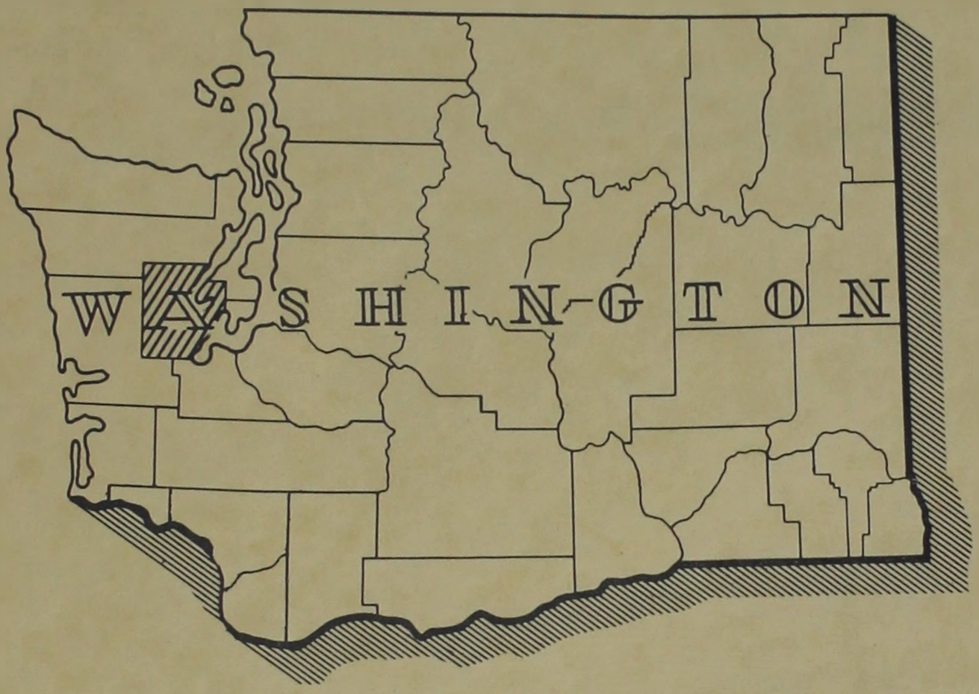
FOREST STATISTICS FOR MASON COUNTY, WASHINGTON

FOREST SURVEY REPORT NO. 110



U. S. DEPARTMENT OF AGRICULTURE · FOREST SERVICE
PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION
R. W. COWLIN, DIRECTOR

PORTLAND, OREGON JULY 1953

PREPARED BY THE DIVISION OF FOREST ECONOMICS

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1/ Acknowledgment is made of cooperation from several private and public agencies.

FOREST STATISTICS

FOR

MASON COUNTY, WASHINGTON

Forest Survey Report No. 110

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F. L. Moravets

U. S. Department of Agriculture Forest Service
Pacific Northwest Forest and Range Experiment Station

R. W. Cowlin, Director
July 1953

FOREWORD

This publication summarizes in statistical form the results of a reinventory of the forests of Mason County, Washington, conducted in 1951. This reinventory is a part of the maintenance phase of the Forest Survey, a Nation-wide project of the Forest Service authorized by the McSweeney-McNary Forest Research Act of 1928 and amended June 25, 1949. The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products and to analyze and make available in reports survey information needed in the formulation of forest policies.

The Forest Survey is conducted in the various forest regions of the Nation by the regional forest experiment stations of the Forest Service. In the Pacific Northwest region of Oregon and Washington it is an activity of the Pacific Northwest Forest and Range Experiment Station at Portland, Oregon.

Under the initial phase of the Forest Survey Mason County was inventoried in 1932 and a statistical report, "Forest Statistics for Mason County, Washington" and a detailed forest type map---scale 1 inch to the mile--were released. In 1940 the first reinventory of the county was made and a revised statistical report and forest type map prepared.

Following the second reinventory, in 1951, the forest type map has again been revised. 1/

1/ A print of the forest type map is available at cost of blueprinting. For information write Director, Pacific Northwest Forest and Range Experiment Station, 423 U. S. Court House, Portland 5, Oreg.

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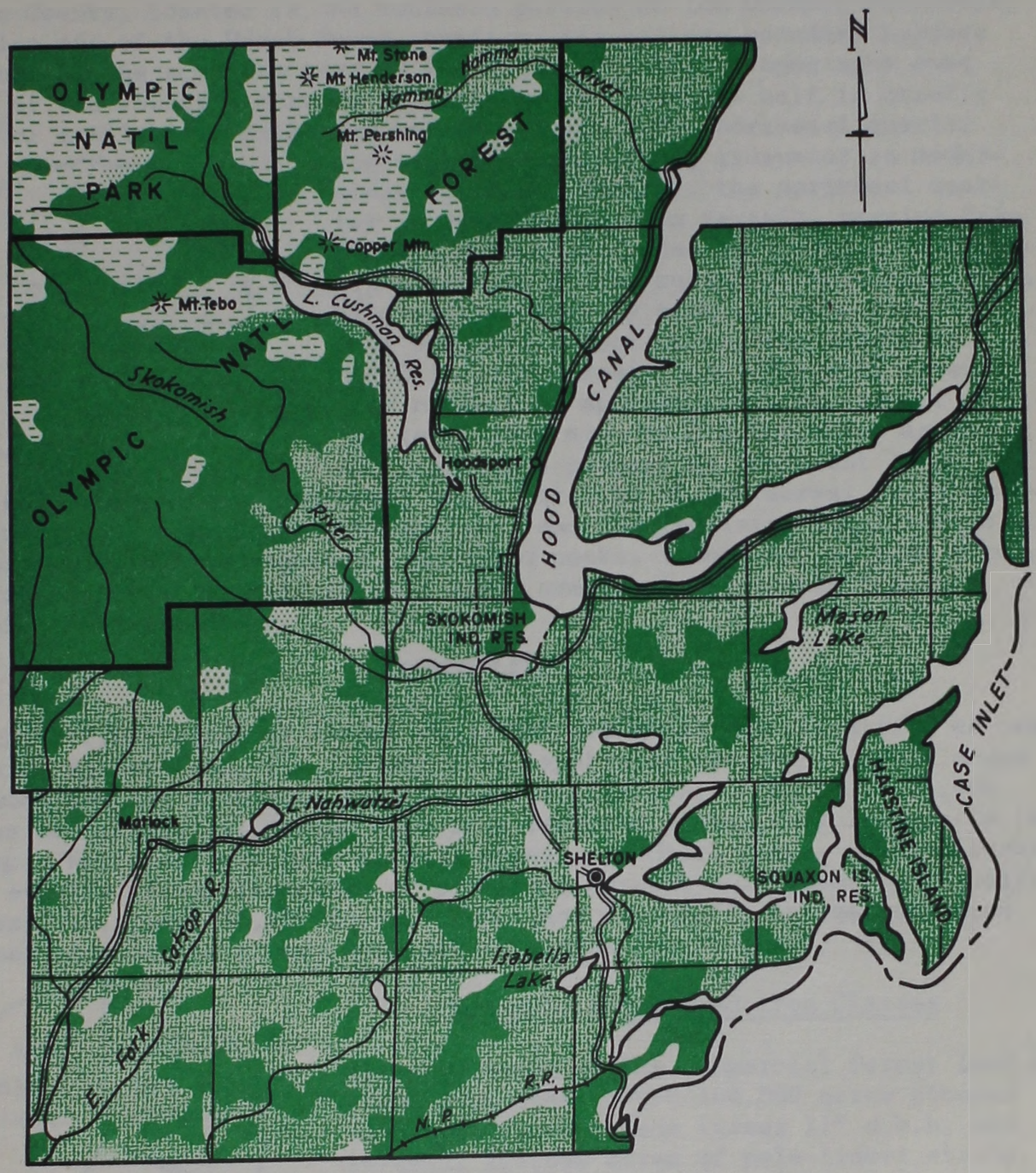
FIGURE 1

FOREST STAND-SIZE AND CONDITION CLASSES

MASON COUNTY, WASHINGTON

1951



LEGEND

- Saw-timber stands
- Pole-timber, seedling and sapling stands
- Recent clear-cut areas, nonstocked
- Old nonstocked cutovers and burns
- Noncommercial area
- Nonforest land

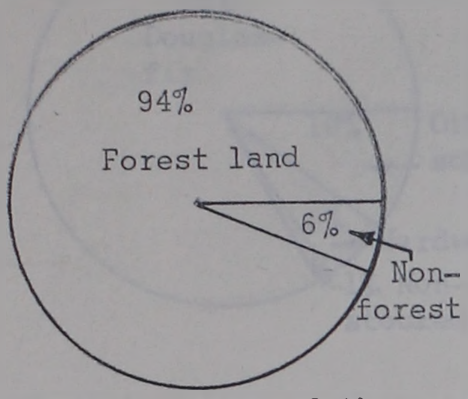
0 5 10 15 MILES

SCALE

SIGNIFICANT FINDINGS IN THE FOREST INVENTORY

LAND USE

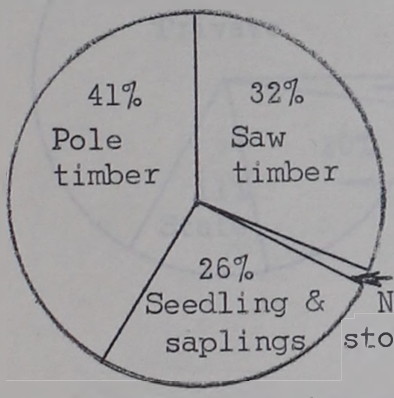
Mason County, located in the southern portion of the Olympic Peninsula, is also one of the Puget Sound counties; its eastern boundary borders on some of the southern arms of the Sound (fig. 1). Topography over much of the county's surface is gentle. The southern half is chiefly part of a slightly undulating upland plateau. The northeast quarter and eastern border along tidewater is moderately rolling. However, the northwest quarter is rough and broken terrain, varying from foothills to high ridges and peaks of a southern extension of the rugged Olympic Mountains. Originally a heavily timbered area with almost complete forest cover, the county is still largely forest land. The 1951 inventory classified approximately 94 percent of the total land area of 612,000 acres as forest land and 6 percent as nonforest land.



About one-half of the nonforest area, totaling 35,000 acres, is in agricultural use, one-sixth is marsh land, and the remaining one-third is comprised of barren mountain ridges and peaks, tideflats, or town sites. The agricultural acreage is in a great number of very small tracts chiefly in dairy farms.

FOREST LAND

Of the 577,000 acres of forest land, 520,000 acres was classified as commercial forest land, i.e., physically capable of producing usable crops of wood and not withdrawn from timber utilization. A total of 21,000 acres was commercial forest land in a reserved status very largely in the Olympic National Park with a small acreage in State parks. Steep, rocky, and sterile areas, incapable of producing merchantable timber physically accessible, total 36,000 acres. Such land is chiefly in the subalpine timber zone on the higher mountainous slopes and ridges.

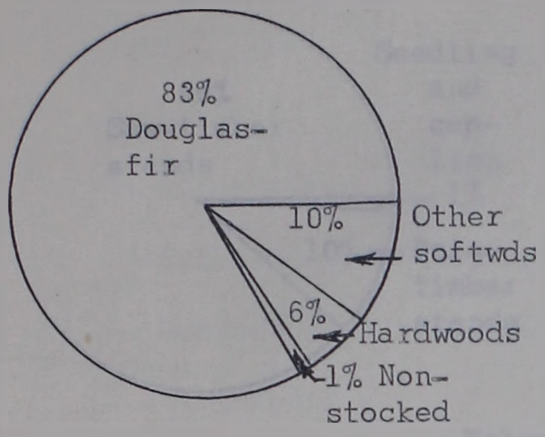


Stand-Size and Condition Classes

Classification of the commercial forest land by stand-size class found 164,000 acres stocked with saw-timber stands (trees 11" d.b.h. and larger), 214,000 acres of pole-timber stands (trees 5" to 11" d.b.h.), and 138,000 acres of seedling and sapling stands (trees 0 to 5" d.b.h.). Together the young stands under saw-timber size cover two-thirds of the commercial area. The area in a nonstocked condition (less than 10-percent stocked) totals but 4,000 acres. This acreage is divided between old clear-cut areas, recently clear-cut areas, and deforested burns, with the major part in the first of these three classes.

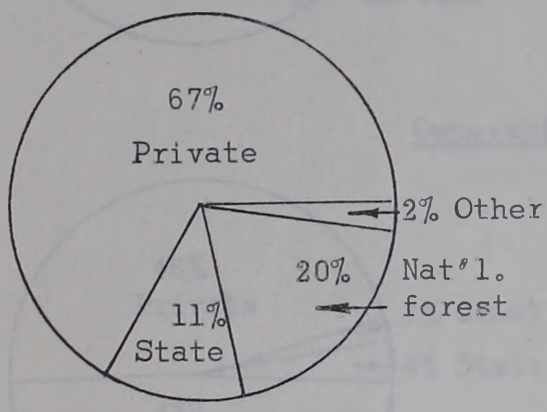
Commercial Forest Land by Type

Douglas-fir, the key species throughout all portions of the county except on the upper slopes and ridges of the mountainous northwest quarter, predominates in stands on 432,000 acres, or five-sixths of the commercial forest land area. Throughout a large part of its occurrence here it forms pure or nearly pure stands. Other softwood types cover 53,000 acres. Above the zone of Douglas-fir type and occupying the middle slopes of the mountainous portion the type is generally of western hemlock, this species is predominant on 33,000 acres, in stands chiefly of saw-timber size. Higher on the slopes and extending upward to the subalpine timber zone the type is composed chiefly of Pacific silver fir with hemlock an associate species. The acreage of hardwood type, totaling 31,000 acres, is included in a large number of small stands, usually in the form of long, narrow type areas along stream courses. Red alder is the principal species and occurs frequently in pure stands; in mixed stands bigleaf maple is the usual associate; and less frequently black cottonwood is an associate. Approximately 70 percent of the hardwood type acreage is stocked with pole timber; the bulk of the remainder is stocked with saw timber.



Ownership of Commercial Forest Land

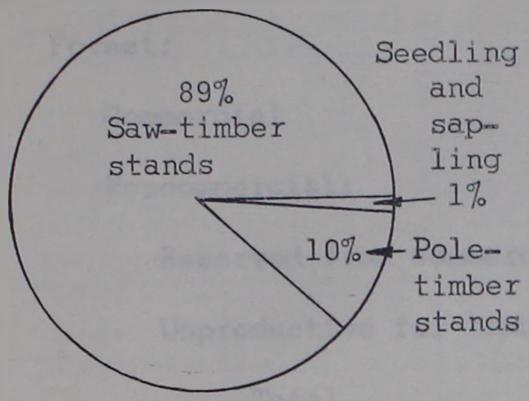
Private ownership of the commercial forest land in this county totals 348,000 acres. This class of owners holds 42 percent of the saw-timber acreage, 79 percent of the acreage of pole timber and seedling and sapling stands, and 59 percent of the non-stocked area. The State of Washington owns 60,000 acres, a very large part of which is stocked with pole timber and seedling and sapling stands. Only 3 percent of the total saw-timber area is State owned. The Federal government owns 103,000 acres of commercial forest land in the portion of the Olympic National Forest that lies in the county. Included in this acreage is 54 percent of the total saw-timber area. There are a few hundred acres of Federally owned public domain in the county. Indian tribal lands total about 5,000 acres, a third of which is stocked with saw timber and two-thirds with pole timber and seedling and sapling stands. The area municipally owned for domestic and industrial water supply totals nearly 5,000 acres; such land is stocked principally with young-growth stands.



TIMBER VOLUME

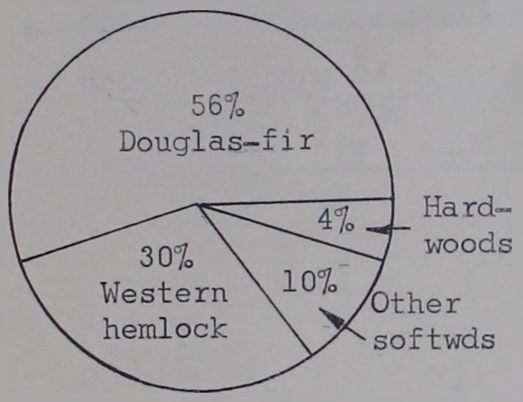
Volume by Stand-Size Class

The net volume of live saw-timber trees (11 inches d.b.h. and larger) on commercial forest land was estimated to be 5,651 million board feet, log scale, Scribner rule. Of this volume, a total of 5,043 million board feet occurs in stands classified as saw timber in the reinventory. The volume of saw-timber trees in pole-timber stands, totaled 581 million and that in seedling and sapling stands totaled 26 million. Such volume is in the overstory of these young stands in either scattered old-growth trees or occasional dominant young trees that have reached saw-timber size.



Volume by Species

The net live saw-timber volume of the softwood species totals 5,389 million board feet; that of the hardwood species totals 262 million. Douglas-fir, the leading species, has a volume of 3,140 million board feet. Western hemlock, with a total of 1,675 million, is another important species here. Other softwoods with lesser volumes include western redcedar, Pacific silver fir, western white pine, Alaska-cedar, Sitka spruce, and lodgepole pine. Red alder comprises two-thirds of the total volume of hardwood saw timber; northern cottonwood, bigleaf maple and madrone make up the remainder.



Ownership of Saw-Timber Volume

Ownership of the saw-timber volume is quite evenly divided between private owners as a class and the Federal government. A total of 2,609 million board feet is privately owned; 2,737 million is on national forest land. The State of Washington has 216 million and there are small volumes each in municipal, Indian, and Federal public domain ownerships.

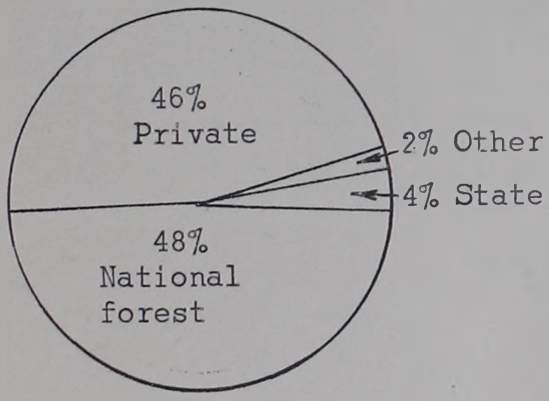


Table 1.--Land area by major classes of land, 1951

Class of land	Area
	Acres
Forest:	
Commercial	520,010
Noncommercial:	
Reserved from commercial timber use	20,910
Unproductive for timber use	36,410
Total	577,330
Nonforest	34,940
Total, all classes	612,270

Table 2.---Commercial forest land area by ownership and stand-size class, 1951

Ownership class	Total	Saw-timber stands	Pole-timber stands	Seedling and sapling stands	Nonstocked areas
	Acres	Acres	Acres	Acres	Acres
Private	348,020	68,340	180,430	96,680	2,570
State	59,530	4,840	22,590	30,760	1,340
Municipal	4,560	740	2,370	1,250	200
Federally owned or managed:					
National forest	102,950	88,520	5,820	8,330	280
Public domain	350	100	240	10	--
Indian	4,600	1,600	2,330	670	--
Total Federal	107,900	90,220	8,390	9,010	280
All ownerships	520,010	164,140	213,780	137,700	4,390

Table 3.--Commercial forest land area by major forest types and stand-size class, 1951

Forest type	Total	Saw-timber stands		Pole-timber stands	Seedling and sapling stands	Non-stocked areas
		Old growth	Young growth			
	Acres	Acres	Acres	Acres	Acres	Acres
Douglas-fir	432,270	29,830	86,600	187,750	128,090	
Western hemlock	32,980	29,570	1,110	1,780	520	
Sitka spruce	300	160		140		
Western redcedar	1,680	680	330	570	100	
White pine	570		120	160	290	
Ponderosa pine 1/	200				200	
Lodgepole pine	9,750			1,930	7,820	
True fir-mountain hemlock	7,040	7,040				
Hardwoods	30,830		8,700	21,450	680	
Nonstocked areas	4,390					4,390
Total	520,010	67,280	96,860	213,780	137,700	4,390

1/ Ponderosa pine is not a species native to this county; the area shown as this type is a plantation.

Table 4.--Area of commercial and noncommercial forest land by cover type and ownership class, 1951

(Acres)

Survey type symbol	Cover type	Total	Unreserved							Reserved			
			Total	Private	State	Municipal	Federal			Total	State	Federal	
							Indian	Public Domain	National Forest			National Park	Military Reservation
	ALL LANDS												
	Forest land	577,330	542,730	348,400	59,590	4,560	4,600	350	125,230	34,600	280	33,760	560
	Nonforest land	34,940	32,950	25,770	900	1,140	1,320		3,820	1,990		1,390	600
	Total	612,270	575,680	374,170	60,490	5,700	5,920	350	129,050	36,590	280	35,150	1,160
	COMMERCIAL FOREST LAND												
D5	Douglas-fir, large old-growth saw timber (yellow fir)	33,730	29,830	5,430	510				23,890	3,900		3,900	
D4	Douglas-fir, small old growth and large young growth (red fir)	41,770	39,130	11,200	1,510	110	90	60	26,160	2,640		2,640	
D3	Douglas-fir, small young-growth saw timber	47,840	47,470	42,240	2,620	560	650	40	1,360	370	130	240	
D2	Douglas-fir, pole timber	188,520	187,750	156,560	21,310	2,250	1,930	240	5,400	770	40	430	300
D1	Douglas-fir, seedlings and saplings	128,230	128,090	90,070	28,220	1,250	630	10	7,910	140	80		60
H4	Western hemlock, large saw timber	33,990	29,570	940					28,630	4,420		4,420	
H3	Western hemlock, small saw timber	1,110	1,110	440		70			600				
H2	Western hemlock, pole timber	1,780	1,780	1,440	240				100				
H1	Western hemlock, seedlings and saplings	520	520	160	40				320				
S4	Sitka spruce, large saw timber	160	160	160									
S2	Sitka spruce, pole timber	140	140	140									
C4	Western redcedar, large saw timber	840	680						680	160		160	
C3	Western redcedar, small saw timber	330	330	330									
C2	Western redcedar, pole timber	570	570	490			80						
C1	Western redcedar, seedlings and saplings	100	100						100				
W3	White pine, small saw timber	120	120						120				
W2	White pine, pole timber	160	160	70	90								
W1	White pine, seedlings and saplings	290	290	290									
P1	Ponderosa pine, seedlings and saplings	200	200		200								
LP2	Lodgepole pine, pole timber	1,930	1,930	1,610	320								
LP1	Lodgepole pine, seedlings and saplings	7,900	7,820	5,480	2,300		40			80			80
FM4	True fir-mountain hemlock, large saw timber	14,980	7,040						7,040	7,940		7,940	
HD4	Hardwood, large saw timber	390	350	200			110		40	40		40	
HD3	Hardwood, small saw timber	8,350	8,350	7,400	200		750						
HD2	Hardwood, pole timber	21,480	21,450	20,120	630	120	260		320	30	30		
HD1	Hardwood, seedlings and saplings	680	680	680									
X	Recent clear-cut area nonstocked	1,650	1,650	840	610	120			80				
XO	Old clear-cut area nonstocked	2,660	2,540	1,730	730	80				120			120
F	Area deforested by fire	500	200						200	300		300	
	Total	540,920	520,010	348,020	59,530	4,560	4,600	350	102,950	20,910	280	20,070	560
	NONCOMMERCIAL FOREST LAND												
NR	Noncommercial rocky	10,390	9,080	380	60				8,640	1,310		1,310	
SA	Subalpine	26,020	13,640						13,640	12,380		12,380	
	Total	36,410	22,720	380	60				22,280	13,690		13,690	
	NONFOREST LAND												
A	Agricultural	18,180	18,180	17,270	80		830						
G	Grass and brush	6,430	5,440	3,900	640		340		560	990		990	
O	Open--nonvegetative	10,330	9,330	4,600	180	1,140	150		3,260	1,000		400	600
	Total	34,940	32,950	25,770	900	1,140	1,320		3,820	1,990		1,390	600

Table 5.--Area of commercial forest land by generalized forest type and ownership class, 1951

(Acres)

Generalized forest type	Total	Unreserved							Reserved			
		Total	Private	State	Municipal	Federal			Total	State	Federal	
						Indian	Public Domain	National Forest			National Park	Military Reservation
Conifer saw timber												
Types D3, D4, D5, H3, H4, S4, C3, C4, FM4, and W3.												
Uncut	170,160	150,770	57,110	4,070	670	740	100	88,080	19,390	130	19,260	
Selectively cut	4,710	4,670	3,630	570	70			400	40		40	
Total	174,870	155,440	60,740	4,640	740	740	100	88,480	19,430	130	19,300	
Conifer pole timber												
Types D2, H2, S2, C2, W2, and LP2.												
On cutovers	186,250	185,640	157,650	21,240	2,250	2,070	240	2,190	610	40	270	300
On burns	3,890	3,730	2,540	720				470	160		160	
On plantations	2,960	2,960	120					2,840				
Total	193,100	192,330	160,310	21,960	2,250	2,070	240	5,500	770	40	430	300
Conifer seedlings and saplings												
Types D1, H1, C1, W1, P1, and LP1												
On cutovers	125,720	125,500	90,850	29,770	1,250	670	10	2,950	220	80		140
On burns	2,240	2,240	1,010					1,230				
On plantations	9,280	9,280	4,140	990				4,150				
Total	137,240	137,020	96,000	30,760	1,250	670	10	8,330	220	80		140
Recent clear-cut areas, nonstocked												
Type X	1,650	1,650	840	610	120			80				
Nonstocked clear-cut and burned-over areas												
Types XO and F	3,160	2,740	1,730	730	80			200	420		300	120
Hardwoods												
Types HD1, HD2, HD3, and HD4	30,900	30,830	28,400	830	120	1,120		360	70	30	40	
Total	540,920	520,010	348,020	59,530	4,560	4,600	350	102,950	20,910	280	20,070	560

Table 6.--Net volume of live saw timber[1/] and growing stock[2/] on commercial forest land by ownership class, 1951

Ownership class	Saw timber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International 1/4-inch rule	Million cubic feet
Private	2,609	2,856	799
State	216	238	77
Municipal	29	32	9
Federally owned or managed:			
Public domain	4	4	1
Indian	56	61	15
National forest	2,737	2,971	622
Total Federal	2,797	3,036	638
All ownerships	5,651	6,162	1,523

1/ Includes live trees 11.0 inches diameter breast height and larger measured in board feet.

2/ Includes live trees 5.0 inches diameter breast height and larger measured in cubic feet.

Table 7.--Net volume of live saw timber and growing stock on commercial forest land by stand-size class, 1951

Stand-size class	Saw timber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International ¼-inch rule	Million cubic feet
Saw-timber stands	5,043	5,473	1,132
Pole-timber stands	581	658	374
Seedling and sapling stands	26	30	16
Nonstocked areas	1	1	1
Total	5,651	6,162	1,523

Table 8.--Net volume of live saw timber and growing stock on commercial forest land by species, 1951

Species	Saw timber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International 1/4-inch rule	Million cubic feet
Softwoods:			
Douglas-fir	3,140	3,437	842
Western hemlock	1,675	1,810	382
Sitka spruce	5	6	2
Western redcedar	248	263	70
Alaska-cedar	12	12	2
Western white pine	111	119	25
Lodgepole pine	4	5	16
Pacific silver fir	194	209	47
Total	5,389	5,861	1,386
Hardwoods:			
Red alder	178	205	114
Bigleaf maple	19	22	11
Black cottonwood	60	68	10
Pacific madrone	5	6	2
Total	262	301	137
All species	5,651	6,162	1,523

Table 9.--Net volume of Douglas-fir live saw timber on commercial forest land by diameter-class group and log rule, 1951

Diameter class and log rule	Douglas-fir
	Million bd. ft.
11.0" to 20.9" d.b.h.	
Scribner rule	1,078
International ¼-inch rule	1,251
21.0" to 30.9" d.b.h.	
Scribner rule	686
International ¼-inch rule	740
31.0" to 40.9" d.b.h.	
Scribner rule	748
International ¼-inch rule	793
41.0" d.b.h. and larger	
Scribner rule	628
International ¼-inch rule	653
All diameter classes	
Scribner rule	3,140
International ¼-inch rule	3,437

Table 10.---Net volume of all timber on commercial forest land by class of material and species group, 1951

Class of material	Total	Softwoods	Hardwoods
	Million cubic feet	Million cubic feet	Million cubic feet
Growing stock:			
Saw-timber trees:			
Sawlog portion	1,101	1,049	52
Upper stem portion	70	67	3
Total	1,171	1,116	55
Pole-timber trees	352	270	82
Total growing stock	1,523	1,386	137
Other material:			
Sound cull trees	1	1	0
Rotten cull trees	17	17	0
Salvable dead trees	20	20	0
Total other material	38	38	0
Total, all timber	1,561	1,424	137

Table 11.--Average annual commodity drain on live saw timber and growing stock on commercial forest land by species group for the period 1948-1951 incl.

Species group	Saw timber						Growing stock		
	Timber products	Logging residual	Commodity drain 1/	Timber products	Logging residual	Commodity drain 1/	Timber products	Logging residual	Commodity drain 1/
	Thousand board feet, log scale, Scribner rule			Thousand board feet, International 1/4-inch rule			Thousand cubic feet		
Softwoods	96,855	13,850	110,705	105,359	15,066	120,425	21,006	3,004	24,010
Hardwoods	4,713	674	5,387	5,405	773	6,178	2,078	297	2,375
Total	101,568	14,524	116,092	110,764	15,839	126,603	23,084	3,301	26,385

1/ Total of timber-products output and logging residual. Timber-products output is the portion of the inventory volume removed from the woods; logging residual is the portion cut or killed in logging not removed from the woods.

FOREST SURVEY PROCEDURE

The procedures used in the second Forest Survey reinventory of Mason County were materially different from the procedures used in the initial inventory and first reinventory. This change in procedures accounts for some significant differences in both the forest-area and timber-volume statistics obtained. Therefore, a brief description of each of the procedures seems desirable.

Initial Inventory

The initial inventory of the county was conducted in 1932 by what was known as the "compilation method." In this method existing information on forest types, timber cruises and extent and location of timber utilization was collected from private timber owners and various public agencies. These data were checked in the field for reliability, and were then adjusted to the specifications and standards of Forest Survey. Forest-type and timber-volume data for areas not covered by existing information were obtained through field reconnaissance.

All land in the county was classified as either forest or nonforest. Forest land was further classified as commercial or noncommercial; the commercial forest land by type, stand-size class, and in case of young-growth stands by stocking and age classes. These types and classes were delineated on 1-inch-to-the-mile base maps of each township. These township type maps were then superimposed over ownership-status plats and dot-counted to obtain forest-type-area statistics by ownership class. Type delineations on the township maps were traced on a base map of the county to form a county forest type map.

In-place, timber-volume estimates were based on the existing cruise data collected from private and public sources, on field cruises, and on ocular estimates. Volume of young-growth saw timber was computed by applying yield-table values, adjusted for age of stand, stocking density, and site, to type acreages.

First Reinventory

The first reinventory included a complete revision of the forest type map of the county. For this revision, records of cutting and other forms of drain, since the original inventory, were obtained from various sources and verified in the field by ground reconnaissance. Areas on which the type had changed due to cutting, restocking of cut-over or burned-over land, and ingrowth of immature stands were remapped on the ground. The ownership status was brought up to date. On the basis of the new ownership data and the revised forest type map, area statistics by forest types were recomputed.

Timber volume estimates for virgin saw-timber stands were based on cruise data collected during the original survey, adjusted for cutting and other drain. Volume estimates for immature stands were determined from yield tables adjusted for site quality, age, and density of stands.

Second Reinventory

In the reinventory made in 1951 complete revision of the forest type map was obtained through interpretation, classification and mapping on aerial photos that covered all parts of the county. In the mapping on aerial photos, types of doubtful classification were checked in the field as was the species composition of stands. The use of aerial photos in mapping resulted in type delineations of much greater accuracy and detail than were possible through the ground reconnaissance employed in the initial inventory and first reinventory. In the preparation of a revised type map, the delineations on the aerial photos were transferred to a 1-inch county base map through use of a photo projector. The new type map was then superimposed over a current ownership-status map of complete county coverage and a dot count made of forest type areas by ownership class.

Volume estimates each of live saw timber, growing stock, and salvable dead material were calculated by applying average-per-acre volumes to the appropriate forest type acreages. The per-acre volumes for saw-timber and pole-timber stands were obtained through a sampling procedure in which the stands were measured on randomly selected plots. Intensity of the sampling was so designed as to produce a total estimate of volume in the county of a specified sampling accuracy set by Forest Survey. In the random selection of samples each individual saw-timber or pole-timber stand in the county had an equal chance of being selected. A sample consisted of a cluster of three one-fifth-acre circular plots spaced at regular 6-chain intervals. A total of 64 plot clusters, or 192 one-fifth-acre plots, was taken in saw-timber and pole-timber stands.

Average-per-acre volumes of scattered saw-timber and pole-timber trees in seedling and sapling stands and on nonstocked areas were obtained through an aerial-photo-plot sampling procedure. A large number of one-acre photo plots was taken in a modified systematic-random pattern. By photo interpretation, estimates were made of average number of trees per acre of both saw-timber and pole-timber size, average crown diameter, and total tree height. Gross volume of the average tree, obtained from photo-volume tables, was adjusted upon basis of an empirical estimate of defect in order to obtain net volume.

SAMPLING ACCURACY

Forest Area

In the reinventory, in-place mapping of the forests and their classification by forest type, stand-size class, or condition class, were on the basis of 100-percent coverage. Therefore no sampling error was involved. Errors due to techniques or judgment were possible but difficult to evaluate.

Timber Volume

For the estimates of timber volume, derived from sampling surveys, the chances are two out of three that the estimated total saw-timber volume in the county does not vary, in either direction, from the true volume more than 7.3 percent; the estimated growing-stock volume does not vary more than 5.4 percent.

COMPARISON OF INVENTORIES

Due to considerable differences in Forest Survey specifications, standards of utilization, and survey procedure, a direct comparison of most of the statistics from the 1951 reinventory as shown in tables 1 to 10, with those from the initial inventory in 1932 and first reinventory in 1940 is not possible. Some of the statistics can be compared after adjustments have been made for differences in specifications and standards.

Forest Land

The forest-land areas, classified by stand-size and condition classes, resulting from the three inventories, are shown in the table below. This comparison is based on the total area of commercial forest land in unreserved and reserved status in the county at the time of the inventory. The 1951 acreage by stand-size class shown in tables 2 and 3 is the area of only the unreserved commercial forest land.

Inventory	Total forest land	Commercial forest land (Unreserved and reserved)					Noncommercial forest land
		Total	Saw timber	Pole timber	Seedlings and saplings	Nonstocked areas	
	Thousands of acres						
1932	578	550	235	68	100	147	28
1940	582	551	189	78	158	126	31
1951	577	541	184	214	138	5	36

With the exception of the seedling and sapling stands and nonstocked areas, the acreages for a given class are on a comparable basis. The saw-timber acreages, for instance, include stands 11.0 inches d.b.h. and larger; the pole-timber acreages include stands 5.0 to 10.9 inches d.b.h. The seedling and sapling acreages for all three inventories include stands from 0 to 4.9 inches d.b.h., but those for 1932 and 1940 do not include stands on areas clear-cut in the past 10 years that were restocked at time of the inventory; such land was included in the nonstocked class. The 1951 acreage does include the area of seedling and sapling stands on recently clear-cut land (cut in prior 10 years) if they were found to be established at time of the inventory. This difference in classification procedure has a corresponding effect on the acreages of nonstocked areas--the 1932 and 1940 acreages included all recently clear-cut land (cut in prior 10 years) regardless of status of restocking at time of inventory; the 1951 acreage does not include the area of such land as had become restocked or had advanced growth in 1951.

The material reduction in acreage of saw-timber stands from 1932 to 1951 is what might be expected in a county in which timber-cutting operations had been consistently large-scale during nearly all of the interval. Particularly significant is the very large increase in acreage of pole timber and substantial increase in seedling and sapling stands during the interval. The small total of 5 thousand acres of nonstocked in 1951 is another significant factor in the county's forest situation.

The larger acreage of noncommercial forest land in 1951 is due to a difference in interpretation and classification of some of the marginal timber on the higher slopes and ridges.

Timber Volume

Direct comparison of the total timber volume obtained in the 1951 inventory with the volumes obtained in the 1932 and 1940 inventories is not possible. One reason is that the minimum diameter specification for saw timber which was 15 inches in the 1932 and 1940 inventories was lowered to 11 inches in 1951. A second reason is that during the 19-year interval there had been much intensification of timber utilization on logging operations; in recent years more of the gross stand volume is being removed from the woods as timber products. In the 1951 inventory this intensification was accounted for by using volume tables that gave significantly greater values for a tree of a given size than did the tables used in the two earlier inventories. A third reason is the inclusion in 1951 of the volume in scattered trees in the overstory of pole, seedling and sapling stands and including a small volume on cut-over and burned-over lands classed as nonstocked.

Comparison of the total cubic-foot volume of growing stock obtained in 1932 with the volume in 1951 is the most feasible because of only slight differences in specifications and standards of utilization

between inventories. In 1932 the total volume of growing stock, which includes both saw-timber and pole-timber trees in all stands, in both unreserved and reserved ownership status was 1,938 million cubic feet; in 1951 the volume was 1,659 million, a decrease of 14.4 percent.

A comparison of board-foot volumes in saw-timber trees in saw-timber stands only is possible only when they are put on the same basis of specifications and standards. The 1932 unreserved and reserved volume adjusted to the 11-inch minimum diameter of saw-timber trees and in terms of the volume tables used in the 1951 reinventory totals 9,403 million board feet; the corresponding volume in 1951 was 5,641 million board feet, a decrease of 40 percent.

DEFINITION OF TERMS USED

Land Area

Total Land

Includes dry land and unmeandered water surface.

Forest Land

Includes (a) land which is at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; and (b) land from which the trees described in "(a)" have been removed to less than 10 percent stocking and which has not been developed for other use. Minimum area of forest land recognized in reinventory of the county was 40 acres.

Nonforest Land

Land that does not qualify as forest land. Minimum area recognized in the reinventory of the county was 40 acres.

Forest Land Classes

Commercial Forest Land

Forest land which is producing, or is physically capable of producing, usable crops of wood, economically available now or prospectively, and not withdrawn from timber utilization.

Reserved from Commercial Timber Use

Forest land withdrawn from timber utilization through statute, ordinance, or administrative order, but which otherwise qualifies as commercial forest land.

Noncommercial Forest Land

Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land and (b) incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Unproductive for Timber Use

Forest land incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Forest Types

Forest Type

A forest stand characterized by the predominance of certain key species--in terms of cubic volume for saw-timber and pole-timber stands, and in number of trees for seedling and sapling stands--or a forest condition such as nonstocked cut-over or burned-over land. The generalized forest types listed in table 3 are of the following composition:

Douglas-fir. Stands comprised of 50 percent or more of Douglas-fir by cubic volume or number of trees.

Western hemlock. Stands comprised of 50 percent or more of western hemlock by cubic volume or number of trees.

Sitka spruce. Stands comprised of 50 percent or more of Sitka spruce by cubic volume or number of trees.

Western redcedar. Stands comprised of 40 percent or more of western redcedar by cubic volume or number of trees.

White pine. Stands comprised of 20 percent or more of western white pine by cubic volume or number of trees.

Ponderosa pine. Stands comprised of 20 percent or more of ponderosa pine by cubic volume or number of trees.

Lodgepole pine. Stands comprised of 50 percent or more of lodgepole pine by cubic volume or number of trees.

True fir-mountain hemlock. Stands in which Pacific silver fir comprises 50 percent or more of the cubic volume or number of trees.

Hardwoods. Stands comprised of 50 percent or more of one of the merchantable hardwood species.

Nonstocked area. Cut-over or burned-over area on which the restocking, if any, is less than 10 percent density and which does not support a residual stand meeting minimum saw-timber requirements.

Tree Classes

Saw-Timber Tree

Softwood or hardwood tree 11.0 inches d.b.h. or larger containing at least one 16-foot log to a variable top diameter inside bark approximating 40 percent of diameter breast height, but never less than 8 inches, and in which one-third or more of the gross board-foot volume is free from rot and defect.

Pole-Timber Tree

Softwood or hardwood tree 5.0 to 10.9 inches d.b.h. in which one-third or more of the gross cubic-foot volume is free from rot and defect.

Cull Tree

Live tree of saw-timber or pole-timber size that is unmerchantable, now or prospectively, because of defect or rot.

Sound cull tree. Live tree of saw-timber or pole-timber size which contains 25 percent or more of sound volume but will not make at least one merchantable log, now or prospectively, because of roughness or poor form.

Rotten cull tree. Live tree of saw-timber or pole-timber size in which less than 25 percent of the total volume is sound.

Salvable Dead Tree

Standing dead or down tree which contains 25 percent or more of sound volume and at least one merchantable log.

Stand-Size Classes

Saw-Timber Stand

Stand of saw-timber trees having a minimum net volume per acre as follows: 5,000 board feet, log scale, Scribner rule, in any species except the pines and hardwoods; 1,500 board feet in the pines and hardwoods.

Old-growth saw-timber stand. Stand in which the majority of the cubic-foot volume is in trees more than about 180 years of age and larger than 21.0 inches d.b.h.

Large old-growth saw-timber stand. Stand in which the majority of the volume is in trees more than 41.0 inches d.b.h.

Large young-growth saw-timber stand. Stand in which the majority of the cubic-foot volume is in trees under about 180 years of age and from 21.0 inches to 40.9 inches d.b.h.

Small young-growth saw-timber stand. Stand in which the majority of the cubic-foot volume is in trees under 180 years of age and from 11.0 to 20.9 inches d.b.h.

Pole-Timber Stand

Stand failing to meet saw-timber-stand specifications but of at least 10-percent stocking of trees 5.0 inches d.b.h. and larger, with at least one-half the minimum stocking in pole-timber trees (5.0 inches to 10.9 inches d.b.h.).

Seedling and Sapling Stand

Stand not qualifying as either saw-timber or pole-timber stand but having at least 10-percent stocking of trees and with at least one-half the minimum stocking in seedlings and saplings (0 inch to 4.9 inches d.b.h.).

Timber Volume

Live Saw-Timber Volume

Net volume in board feet of live saw-timber trees:

Scribner rule. The common board-foot rule used in determining log-scale volume of saw timber in this region. This rule underestimates, particularly in case of timber of the smaller diameters, the volume of lumber that could be produced from the timber.

International $\frac{1}{4}$-inch rule. The standard board-foot rule adopted by the Forest Service in the presentation of Forest Survey volume statistics. Volumes in this rule approximate lumber tally.

Growing Stock

Net volume in cubic feet of live saw-timber trees and live pole-timber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

Salvable Dead

Dead trees, standing or down, in which at least one-third of the gross volume is free from rot or defect and in which sound volume totals at least 30 board feet.

Saw-Timber Volume

Net volume in board feet of live and salvable dead saw-timber trees to a merchantable top.

All-Timber Volume

Net volume in cubic feet of live and salvable dead saw-timber trees and pole-timber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark.

Commercial Tree Species

Tree species that are considered in determining stocking of stands and growing-stock volume. Includes species presently or prospectively usable for commercial timber products.

Commercial tree species in Mason County include:

Softwoods:

Douglas-fir (Pseudotsuga taxifolia).
Western hemlock (Tsuga heterophylla).
Sitka spruce (Picea sitchensis).
Western redcedar (Thuja plicata).
Alaska-cedar (Chamaecyparis nootkatensis).
Western white pine (Pinus monticola).
Lodgepole pine (Pinus contorta).
Pacific silver fir (Abies amabilis).

Hardwoods:

Red alder (Alnus rubra).
Bigleaf maple (Acer macrophyllum).
Black cottonwood (Populus trichocarpa).
Pacific madrone (Arbutus menziesii).

Commodity Drain

Commodity Drain or Live Saw Timber

Board-foot volume of live saw-timber trees removed from commercial forest land during a specified year as timber products and that left as logging residue.

Timber products output. The live saw-timber volume entering into timber products during a specified year.

Logging residue. The live saw-timber volume that is cut or killed in logging during a specified year but is not removed from the forest as timber products.

Commodity Drain on Growing Stock

The cubic-foot volume of live saw-timber and pole-timber trees removed from commercial forest land during a specified year as timber products and left as logging residue.

Timber products output. The growing stock volume entering into timber products during a specified year.

Logging residue. The volume of growing stock that is cut or killed in logging during a specified year but is not removed as timber products.